# Proposed Part 201 Tapwater Exposure Pathway




State of Michigan
DEQ
Department of Environmental Quality

# Goals for the Tapwater Pathway

- Accurately represent the environmental exposure
- Harmonize with the most current EPA risk assessment guidance and practices
- Represent the state of the science
- Emphasize protection of children in residential exposure scenarios
- Consistency with "Federal standards"

# Proposed Part 201 Tapwater Exposure Pathway

- Primarily based on the EPA Region 9 Regional Screening Level (RSL) methods and tables for Tapwater exposure (risk assessment for CERCLA sites)
- EPA Risk Assessment Guidance for Superfund (RAGS) guidance documents
- EPA Exposure Factors Handbooks

# Proposed Part 201 Tapwater Exposure Pathway

- The proposed Tapwater criteria will represent risk-based concentrations of hazardous substances in groundwater that is used as Tapwater and are expected to be protective of adverse health effects from long-term exposure.
- Continue to be relevant for groundwater in an aquifer or that can reasonably be expected to transport a hazardous substance into an aquifer (Rule 710(1)(a)-(b))

# Tapwater = Any Indoor Household Water Use








# Drinking Water vs. Tapwater Exposure Routes

- Residential
  - Current Part 201 Drinking Water pathway
    - Ingestion
  - Proposed Part 201 Tapwater pathway
    - Ingestion + Inhalation of volatile hazardous substances released into household air from Tapwater use
    - On 12/1/11, EPA updated their Tapwater risk assessment methodology to also include Dermal exposure
    - Need to evaluate EPA's new Tapwater methodology

# Drinking Water vs. Tapwater Exposure Routes

- Nonresidential
  - Current Part 201 Drinking Water pathway
    - Ingestion
  - Proposed Part 201 Tapwater pathway
    - Ingestion
    - Inadequate data to support a generic nonresidential exposure scenario with an Inhalation (and now Dermal?) exposure route
    - No nonresidential (worker) EPA RSL exposure pathway for groundwater, defaults to residential exposure assumptions
    - Need to evaluate EPA's new Tapwater methodology

# Proposed Tapwater Pathway Changes

1. Inclusion of an inhalation (and dermal?) component(s) to the residential groundwater exposure pathway.

# Tapwater Inhalation Exposure Route

- Relevant to volatile hazardous substances
- Chemical-specific, based on incorporation of an inhalation toxicity endpoint
- Non-chemical-specific, based on the incorporation of a generic volatilization factor for all volatile hazardous substances

# Groundwater Exposure Routes

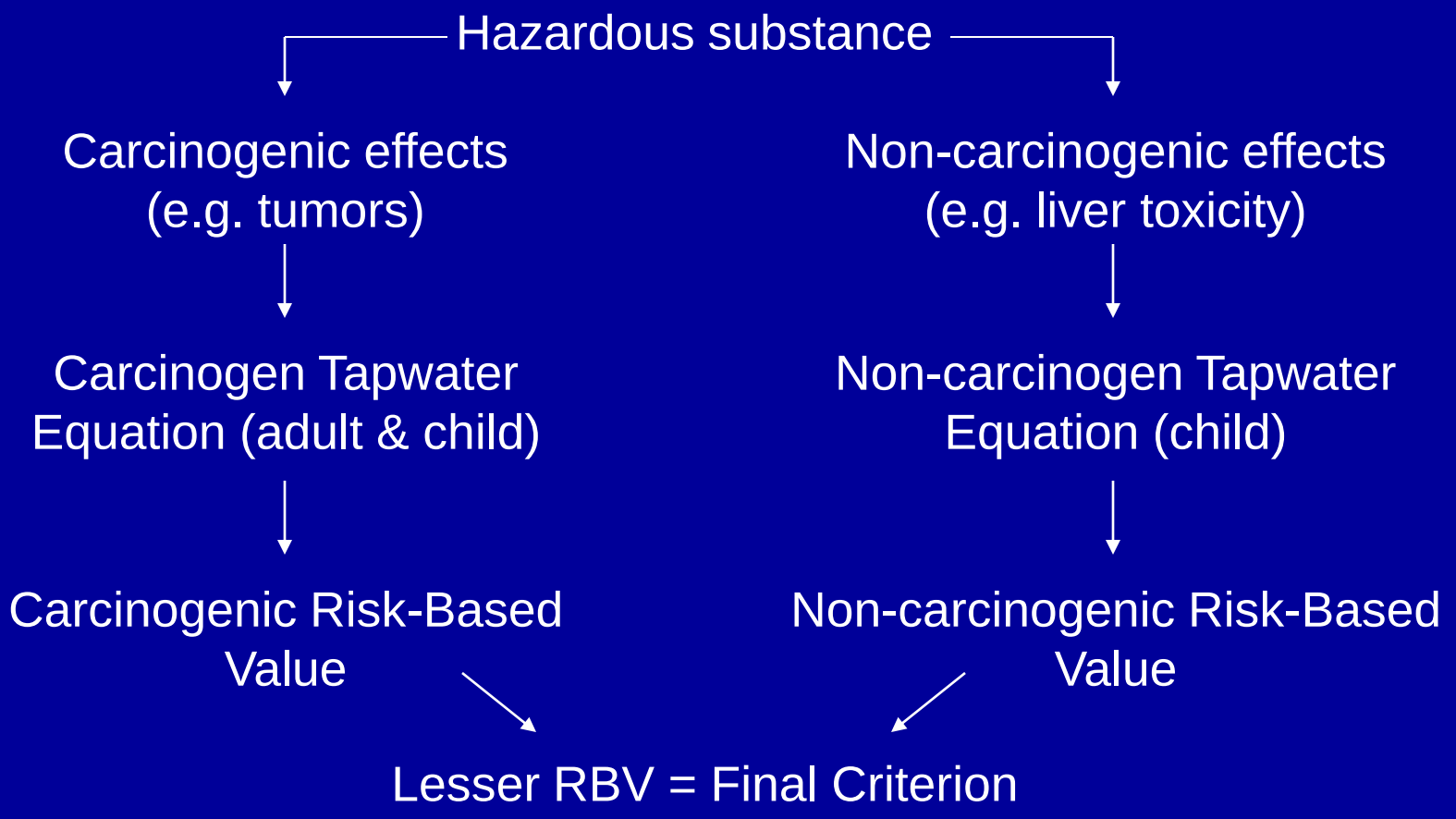
| | State/Federal Environmental Agency | | | | | | |
|---|---|---|---|---|---|---|---|
| | MI | IL | IN | MN | OH | WI | EPA RSLs* |
| Ingestion | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ |
| Inhalation | ☑ | ☐ | ☑ | ☐ | ☑ | ☐ | ☑ |
| Dermal | ? | ? | ? | ? | ? | ? | ☑ |

* Regional Screening Levels (formerly the Preliminary Remediation Goals or PRGs)

# Proposed Tapwater Pathway Changes

1. Inclusion of an inhalation (and dermal?) component(s) to the residential groundwater exposure pathway.
2. A child (0-6 years old) will replace the adult as the proposed residential receptor for non-carcinogenic effects.

# Residential Receptor



# Residential Receptor

| | State/Federal Environmental Agency | | | | | | |
|---|---|---|---|---|---|---|---|
| | MI | IL | IN | MN | OH | WI | EPA RSLs* |
| Adult | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ | ☑ |
| Child | ☑ | ☐ | ☐ | ☐ | ☑ | ☐ | ☑ |

EPA updated their noncarcinogenic residential Tapwater RSL receptor from an adult to a child on 12/1/11.

* Regional Screening Levels (formerly the Preliminary Remediation Goals or PRGs)

# Primary Tapwater Pathway Changes

1. Inclusion of an inhalation (and dermal?) component(s) to the residential groundwater exposure pathway.
2. A child (0-6 years old) will replace the adult as the proposed residential receptor for non-carcinogenic effects.
3. Exposure assumptions are updated to represent the current EPA recommended exposure values.

# Exposure Assumptions

- Residential non-carcinogen
  - Adult → child exposure assumptions
    - Ingestion & Inhalation (& Dermal?)
- Residential carcinogen
  - Updated adult exposure assumptions
    - Ingestion & Inhalation (& Dermal?)
    - Adult body weight: 70 kg (154 lbs) → 80 kg (176 lbs)
    - Drinking water ingestion rate: 2.0 L/day → 2.9 L/day
- Nonresidential

# Continuity with Drinking Water Criteria

- 324.20120a(5) will continue to apply to the development of the final Tapwater criteria
  - State drinking water standard (MCL)
  - Aesthetic groundwater standard
- 324.20120a(10) will continue to apply to the development of the final Tapwater criteria
  - Target Detection Level (TDL)
  - Background groundwater concentration

# Tapwater vs. Drinking Water Criteria

- In general, the proposed residential Tapwater criteria will be less than the current residential Drinking Water criteria because of one or more of the following:
  - Addition of the inhalation exposure route
  - Updated receptor exposure assumptions
  - Updated chemical-specific toxicity data
  - Updated chemical-physical data
- Residential Tapwater criteria will be even lower with addition of dermal exposure component

# Tapwater vs. Drinking Water Criteria

- In general, the proposed nonresidential Tapwater criteria will be greater than, equal to, or less than than the current nonresidential (Ind/Com) Drinking Water criteria because of one or more of the following:
  - Updated receptor exposure assumptions
  - Updated toxicity data